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MIND AND MATTER IN CULTURE

BY OTIS T. MASON

The word culture here applies to all the artificialities of human life. It is the history of man recorded in the works of his hands. Culture-history is the story of this wonderful progress as written in what remains of the record of the past in two depositories — archeological relics, and the survivals of ancient activities in the hands of savages and the backward among civilized peoples. This progress has been an appropriation of all the material of which the earth is composed and the domination of the forces of nature for the help of man. It is the second of the two grand divisions of Anthropology, namely — Physical Anthropology and Cultural Anthropology, or Eurematics.

INVENTION. — Forget for the moment that there is any biological kinship between mankind and animals, in order to fix the mind on the word "invention."

It is not necessary to confine oneself to patent offices and letters patent, for children invent as soon as they walk. Men and women of all races and conditions, in all ages, were engaged in devising. In this respect, there has been an unbroken kinship of minds, savage and civilized, from first to last. The animals construct habitations, store food, and use wonderful contrivances. They have seen the dawn of culture-history; but their tools and apparatus are so admirably provided in their anatomy that their minds are not fully awakened. The "cunning little creature called man" would seem to have been deprived of wings, fleet feet, horns, claws, and fangs, and endowed with a corresponding quantity and intricacy of brain.

WANTS. — At the foundation of infinite invention lie the words "wants," "desires," sharply distinguished from the word "needs." The former are the artificializing of the latter. The occupations called humanities have resulted, and tracing their origin is the climax of culture-history.

The artificializing of needs into wants and desires has developed into six general directions and produced an equal number of groups or classes of activities based on the nature of man:

1. *Language*, the expression of thought, giving rise to the sciences of glossology, philology.

The moment an infant is self-conscious, it proceeds to indicate its wants and feelings. It receives encouragement at every step, and the result is the mature language of gesture, voice, symbol, pen, press, terminating in endless patents for giving out and recording thought.

2. *Industries*, to supply wants, giving rise to the science of technology, in the widest sense of the term. It includes all artificialized activities to supply demands for aliment, clothing, shelter, and getting about, together with the endless list of implements, tools, utensils, machines, and conveniences without which we come to think that we cannot live, and whose practice is industrialism.

3. *Esthetic arts*, to give and foster pleasure. They include all artificial activities whose end is gratification. The senses are the doorways, and when their satisfaction is for its own sake, the fine arts are the results. But eating, drinking, perfume, bathing, and play, among the lowest as among the highest, have consumed much time and thought. The science of fine art is esthetology. Culture-history investigates and illustrates the origin of the arts beautiful, their progress and climaxes.

4. *Social activities* of all kinds, for reproduction or culture, giving rise to the family life, the industrial life, the civic and national life, and all sorts of unions or associations for welfare or pleasure. The special science is sociology. In the lower culture-states and culture-periods it is more observant of clans, gentes, tribes, and totems. In the higher culture, nations are the political units and all activities are organized.

5. *Knowledge and the explanation of things*, whose science is

sophiology. In it are included the lore of the uneducated and of primitive culture, as well as science, history, and philosophy of the civilized. All peoples are sure that they understand and can explain all phenomena, and the historic instinct is universal.

6. *Creeds and cults*, the last activities and thoughts and things to be mentioned grew out of beliefs and practices in relation to a spirit world. The term religion in its widest sense covers this whole class of phenomena, including organization of society for its regulation and all its operations and worships. The words daimonology and hierology apply to its culture-history.

MUTUAL SERVICE OF ACTIVITIES. — No class of activities exists for itself alone. There are actions in each, no doubt, which end in the performance; but there are very many more that are altruistic, cosmopolitan — performed by one class for the benefit or to supply the wants of other classes. Cicero, in his Oration for Archias, hits off my thought exactly: "For all the arts belonging to humanity (culture) have a kind of common bond, and among themselves are associated by a species of fellowship." We are to study the socials in culture as well as its solos.

Language lives for industries, esthetic arts, social demands, knowledge, and religion. It might be said that they all exist for it to talk about.

Industries thrive on language, fine art, society, science, and religion.

Esthetics changes speech into poetry, rhetoric, and the drama; overlays industry with beauty; mingles the *utile cum dulce* in social activities; develops thought in art and studies its philosophy; and lays its climaxes at the feet of the spirit world.

Association lies at the basis of all culture. No man and no art liveth for self or dieth for self. There must be speaker and hearer in language; subjective and objective in art and industry; cooperation in thought and science; and clergy and laity in religion.

Knowledge and *Science* demand the best that language can offer and stimulate its expansion and perfection; claim all industries as their own; guess at the secrets of Nature and reveal them to the inventor; put at the service of fine art the rules of number, proportion, and harmony; preserve the records of social order, census, commerce, and exchange; point out their own faults and dangers and assign methods for their betterment; and give to conceptions of the spirit world the true order of nature and a rational basis for creeds and cults.

Religion brings to language its most exalted themes, to industries its promises and consolations, to art its highest inspirations, to social organizations their rules of conduct, and to the search for knowledge its all-absorbing problems.

Here one set of motives or one person is in the lead and others follow suit; but in another class or time, the tables are turned—the leader is subordinated, the slave is master, the humble is exalted. There is little chance for great physical differences in this diversification of functions.

This hasty survey is only a sketch of the simplest binary associations among the six classes of activities and, as culture advances, the mixtures become more and more complex, until all are found in the service of each. In the ethnological exhibits of the National Museum, the family life, the village life, and the ceremonial life are shown in groups of lay figures, the industrial and the esthetic life in groups and in series of objects, and the language, lore, and religious creeds are exhibited in literature. The photograph lends aid to all. There is no time here to follow up this fascinating study. The more profoundly one becomes absorbed in his special pursuit, the more will he look on all culture as belonging to his sphere of thought.

THE PHYSICAL BASIS OF CULTURE. — Culture has had to do from first to last with the physical universe for its resources, environments, and forces, chiefly in the earth, the waters, and the air; but in the cosmos also are they stored up, and out of these have arisen all the artificialities of human life. Speech is only waves of air; industries arise out of subservient matter and motion; esthetics goes to Nature for its materials and methods; society is based on instincts vastly older than man; thoughts, opinions, lore, knowledge, science, philosophy, wisdom — all grow and are made possible by the reign of law; and Nature gives form and function to religion.

But in order to keep the notion of culture through invention in the foreground, it is necessary to insist on Nature's second rank. She is servant and not master. She it is whose properties and qualities give out first. It is the glass and not the mind that first fails in astronomy; the bolometer owes its fatigue and exhaustion to the manufacturer of steel, not to the physicist. Everywhere, at the end of the promising vistas of Nature there are sealed doors and barred gates.

The advancing minds and races took possession of the earth, not merely to accept the bounty offhand, like the animals, but to explore, secure, domesticate, or destroy its resources; to manufacture and reconstruct them; to move them and themselves artificially; to exchange, measure, and value them; to consume and enjoy them. The order of Nature seems to have been reversed, invention beginning with zoötechny and passing upward through plant culture and lithotechny to the mastery of forces.

To bring the resources of Nature into service and to accomplish these results just set forth, human brain and brawn would have been inadequate.

The harnessing and training of movements in Nature known as forces — muscle, gravity, wind, water, fire, chemism, and electricity were necessary. The gradual achievement of this marked the epochs in human progress —

1. Man power — hand epoch, manual skill.
2. Fire power — epoch of human mastery and metallurgy.
3. Beast power — epoch of domestication.
4. Wind power — epoch of the sail, navigation.
5. Water power — epoch of gravity.
6. Steam power — epoch of machinery.
7. Chemical power — epoch of scientific manufacture.
8. Electric power — epoch of climactic invention in speech, light, heat, and locomotion.

The utilization has been cumulative, so that a power house is a kind of House that Jack Built.

How to substitute the forces in the environment for the working of the hand has been the problem of the engineer and the machinist in all ages. The devices between the force and the effect have been —

Devices	*Effects*
1. Weights	Motion, pressure, blows.
2. Springs	

3. Inclined plane	Reduced weight and resistance.
4. Wedge	Riving and tightening.
5. Sled	Reducing friction.
6. Roller	Changes and destroys friction.
7. Wheel	Combines 5 and 6.
8. Wheel and axle (cog and band)	Multiply power and change its direction.
9. Pulleys	

10. Twisting, shrinking, and clamping devices.
11. The screw in holding, clamping, and motion.

In putting this series into activity, differentiated tools were developed; working alone or in combination —

1. For striking, either alone or with other results.
2. For rectilinear or curvilinear motions.
3. For breaking in pieces, grinding.
4. For battering surfaces.
5. For chipping silicious, fragile materials.
6. For abrading by friction.
7. For polishing surfaces.
8. For cutting with an edge.
9. For sawing, with or without sand.
10. For perforating.
11. For holding together.
12. For twisting textile substances.

The working part of the tool has maintained a steadfast plan ot functioning, but the changes of the manual part have constituted the history of machinery.

CHANGES PRODUCED THROUGH INVENTIONS. — The modifications produced through inventions in all ages have been in many directions and each has had its effect on all divisions of culture. Vast changes have been wrought upon the earth, air, and waters, by man. His first masterpiece, fire, made awful havoc in the hands of the savage, followed by floods and malicious winds. Invention has been going on without cessation from first to now with changes.

1. In the things devised, commonly called inventions:
    a. From naturism to artificialism.
    b. From simplicity to complexity.
    c. From clumsiness to delicacy and beauty.

d. From waste to economy.
e. From discomfort to comfort.

This declaration applies to the six divisions of culture. Language was in the childhood of our species a mass of incoherent cries; handicraft was only slight modification of things inanimate; esthetic objects were plucked from nature; society, wisdom, and worship were only in their rudiments.

2. In all the processes and apparatus involved in the production and use of inventions the earliest inventors acted alone; while in modern life the vast amount of subsidiary changes involved in an invention often demands a corps of specialists and national legislation.

3. In rewards and benefits, at first the reward accrued to the individual and stimulated others to copy; while to encourage this most precious and beneficent faculty the most enlightened nations grant exclusive patents and crown the inventor among the heroes of the species. The benefits to society have expanded and intensified with the fortunate races and peoples, until it is impossible to calculate the good that has come to the commonweal of humanity through any one of the epoch-making inventions.

4. In thought, not only of the inventor's mind, but in all who come under his influence. After the birth of his happy idea, he is no longer the same person. Old things are passed away, all things are new. Other minds are affected; the contagion spreads far and wide.

There are places where the inventor's contrivances produce no material alterations. He cannot change the heavenly bodies, but his thoughts about them have been revolutionized by his ways and means of looking at them. This mental evolution has been manifested in the very citadel of change, the inventive faculty itself. The first instrumentalities were mere borrowing, taking things ready made, and copying others for new functions — a quiet stone for a lively hammer; the houses of mollusks for dishes, spoons, tools, and musical instruments; thorns for awls, etc. The latest are out-and-out creations. The inventor does not walk abroad for suggestions; he is not surprised by the unexpected, but sits down in his laboratory, shuts his eyes, and gives the creator spirit full sway.

5. In society, the coöperative mind has been elaborated through the growing complexity of invention. Schools of fine art with their motives, legislatures in their enactments, institutions of instruction and research, are perpetuated and organized — thinkers, exploring the spheres and the spirit world for new materials, motives, and forces. The renaissance of the white subspecies of humanity is its noblest product.

THE FUTURE OF CULTURE-HISTORY. — The scientific study of culture is yet in its infancy. There is ample work to do in solving —

Development of artificiality in time.
Evolution of complexity in devisings.
Genealogical connections of inventions.
Geographic distribution of thought.
Relation of culture to environments.
Acculturation through blood kinship, accident, traveling about of peoples, and cosmic movements — including winds, currents, migrations of birds, fishes, and mammals.

1. In the changes from naturism through manganism the story will run —

From cries and gestures to perfect transmission of thought.
From natural fire to fire, the docile servant.
From woman's nimble fingers to Jacquard loom.
From personal decoration to idealized art.
From common refuge to national fortification; from herding together to organized armies.
From childish lore to cyclopedic knowledge.
From personeity in causation to organized science.
From hecastotheism to monotheism.
From simplicity to complexity.

2. The coming student of culture will study out the changes of invention —

From stone hammer to steam hammer.
From flint saw to ribbon saw.
From chipped scraper to planing mill.
From woman's back to palace train.
From skin float to ocean steamer.
From conch shell and rattle to orchestra.
From ephemeral partnership to international commerce.

From personal friendship to universal brotherhood.
From tribal life to the congress of nations.
From lonely guessing to international standards.
From tribal deity to the Infinite and Omnipresent.

3. The ways from clumsiness to delicacy will pass through the many series of progression from mere need supply to refined enjoyments, from brute force to grace, from worse to better ideals in morals. The two pillars in front of Solomon's temple were Jachin and Boaz, beauty and strength, typifying world progression upward —

From stammering cries to the great epics and dramas.
From stifling smoke to scientific heatings.
From groaning cart to Pullman car.
From gluttonous feast to refined dining.
From fig-leaf apron to ceremonial costume.
From digging stick to buggy cultivator.
From cave refuge to charming home.
From wild shouts in unison to the symphony.

4. The changes from waste to economy will include also interesting research. Our ancestors did destroy ruthlessly the bounties of Nature, and the modern forest and coal wasters have been greater than they. But the tendencies have been —

From waste to frugality.
From ancient mining to recent methods.
From camp and forest fires to steam and electric heating.
From savage roast to French cuisine.
From primitive tillage to scientific husbandry.
From Jack-at-all-trades to specialized manufacture.
From dispersive living to coöperative comfort.
From separate establishments to corporations.
From hiding the truth to knowledge in common.
From war to arbitration.

Thorough examination of culture-changes will show, in all the past, struggles for ease; and the transitions have been from discomfort to comfort. Looking backward over the progress of invention among the nations reveals such a change. New departures of activity in the conquest of a new force seem to contradict this. The devices break down, go out, will not work, give annoyance, and are accompanied often with increased hardship. They convey discomfort, not comfort. This, however, is only transitory defeat, leading to later victories. It is a melancholy truth, however, that this change has in the past seduced nations to their decline and fall. The evolution is seen in the transfer —

From log seat to gorgeous furnishings.
From the naked ground to the feather bed.
From plodding to riding at work.
From toilsome hand work to machine work.
From open fire to electric heating.
From wandering savagery to the settled home.
From blood revenge to jury trial.
From cold indifference to organized charity.
From selfish motive to the golden rule.

FROM INDIVIDUAL TO GENERAL STUDY. — This paper would be without a motive if it did not extend a cordial invitation to every thoughtful person to take part in deciphering records of the mind's victories written by inventions. It matters not what one's calling or favorite study may be, its materials, apparatus, and processes have a genealogy as old as the human species. Every word voiced, written, gestured, or messaged; every activity in which tools, utensils, or apparatus may be used; every artistic creation; every aggregation or congregation of human beings for a specific purpose; every suggestion for explaining phenomena, every advance in knowledge or its instrumentalities; and all beliefs and worships belong to human culture and their investigations to culture-history. Nothing common is trivial; the accumulation of well-observed facts is as important as the epoch-making invention.

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